GETINGE

GETINGE 88-SERIES
INSTALLATION MANUAL
502404200

SEV0647139-

GETINGE

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FOREWORD

This instruction manual is intended for users of the Getinge washer disinfector 88-5.
The instruction manual describes the design and operation of the machine and the maintenance for which the user is responsible. The purpose of the information in the manual is to ensure safe operation and optimum efficiency.
Before using the machine for the first time, users must have read this instruction manual and familiarized themselves with the operation of the machine and its safety instructions.

Read through the instruction manual before using the machine.

The information in this manual describes the machine as dispatched from Getinge. There may be differences due to customization.
The machine is accompanied by the following documentation:

- User manual
- Installation instructions (this manual)
- Technical manual
- Spare parts list
- Goods positioning instructions

The Goods positioning instructions supplied must be put up in a clearly visible position at the time of installation.

Getinge reserves the right to change the specification and design without prior notice.
The information in this manual was up to date on the date of issue of the manual.

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SAFETY REGULATIONS

This machine has been designed with a number of built-in safety devices. To avoid injury, it is highly important not to bypass or disable these safety devices.
If the equipment is used in a manner not specified by the manufacturer this can impair the safety equipment on the machine.

Operators and maintenance personnel must undergo safety training for the machine.
All personnel who handle chemicals for washing and disinfection must understand the washing process, possible health hazards and ways of detecting leaks of toxic chemicals.
Operators and maintenance personnel must undergo regular training in the operation and maintenance of the equipment. There must be a documented list of personnel who have been trained on the machine. Trained personal must be tested to verify the training programme.

Important

- Take care when handling the chemical agents used in the machine.
  Read the instructions on the pack or contact the manufacturer before using the machine for instructions about:
  - what to do if the substance comes into contact with the eyes or skin or if vapors are inhaled.
  - storage of packs and sorting of empty packs for disposal.
- The machine must be connected in accordance with the instructions given in the installation manual.
- The machine may only be used by adults.
- Installation and servicing may only be done by personnel trained for this machine.
- Never bypass door safety switches.
- Leaks in the system caused by worn seals in the door, for example, must be repaired immediately.
- Before doing any repair or servicing work, the personnel concerned must study the relevant handbooks and service manuals.
- Before any welding is done, all cables connected to the control system via connectors and sockets must be disconnected.
- Before doing any servicing or maintenance work on the machine, isolate it from the electric power supply and drain all tanks.
- Do not wash down or hose down the machine with water.
- Take care when using corrosive substances.
- Observe safety measures for steam and hot water.
- The machine must not be operated with cladding plates, roof and plinths removed.
- Doing this puts at risk the safety and functioning of the machine.
- The electrical cabinet may only be opened by authorized and trained personnel.
- Spare parts may only be obtained from Getinge EDC.

The machine must be assembled and installed:

- by qualified personnel.
- in accordance with current local regulations and rules.

Warning!
To avoid the risk of back injury, this equipment should be assembled and installed by two people.

When the work is complete, check that

- all parts have been installed in accordance with the installation instructions
- all screws have been properly tightened
- there are no sharp edges on any parts that may come into contact with people
- all hoses, pipes and connections are intact and free from defects
- all the functions of the machine are working properly. Adjust if necessary.

Carry out an Installation Qualification, an Operating Qualification and a Performance Qualification according to ISO 15883 before putting the machine into service.

Incorrect use can result in damage to objects and personal injuries

Product liability

Any modification or incorrect use of the equipment without the approval of Getinge Disinfection AB invalidates Getinge Disinfection AB´s product liability.
This product was manufactured by:
GETINGE DISINFECTION AB
Ljungadalsgatan 11, Box 1505
351 15 Växjö, Sweden

CE 0413

Isolator switch

The machine must be fitted with a separate, lockable isolating device in the electric power supply. The isolating device must be easily accessible on a wall close to the machine. The installation must conform to and be marked in accordance with local provisions.

Attention symbols

Some of the warnings, instructions and advice in this manual are so important that we use the following special symbols to draw attention to them. The symbols used are as follows:

This symbol indicates a warning in the text of the manual. It warns of a hazard that may lead to more or less severe injury and in certain cases mortal danger. It also highlights warnings to avoid damage to equipment.

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INSTALLATION

- The floor where the machine is to stand must be flat and level within ±5 mm.
- Pull the machine (on a transport pallet) to the location where it will be installed.
- Lift the machine off the pallet.
- Position the machine at the chosen location and adjust the feet so that the machine is stable.
- Adjust the loading cart docking system vertically and laterally so that it fits with the cart.

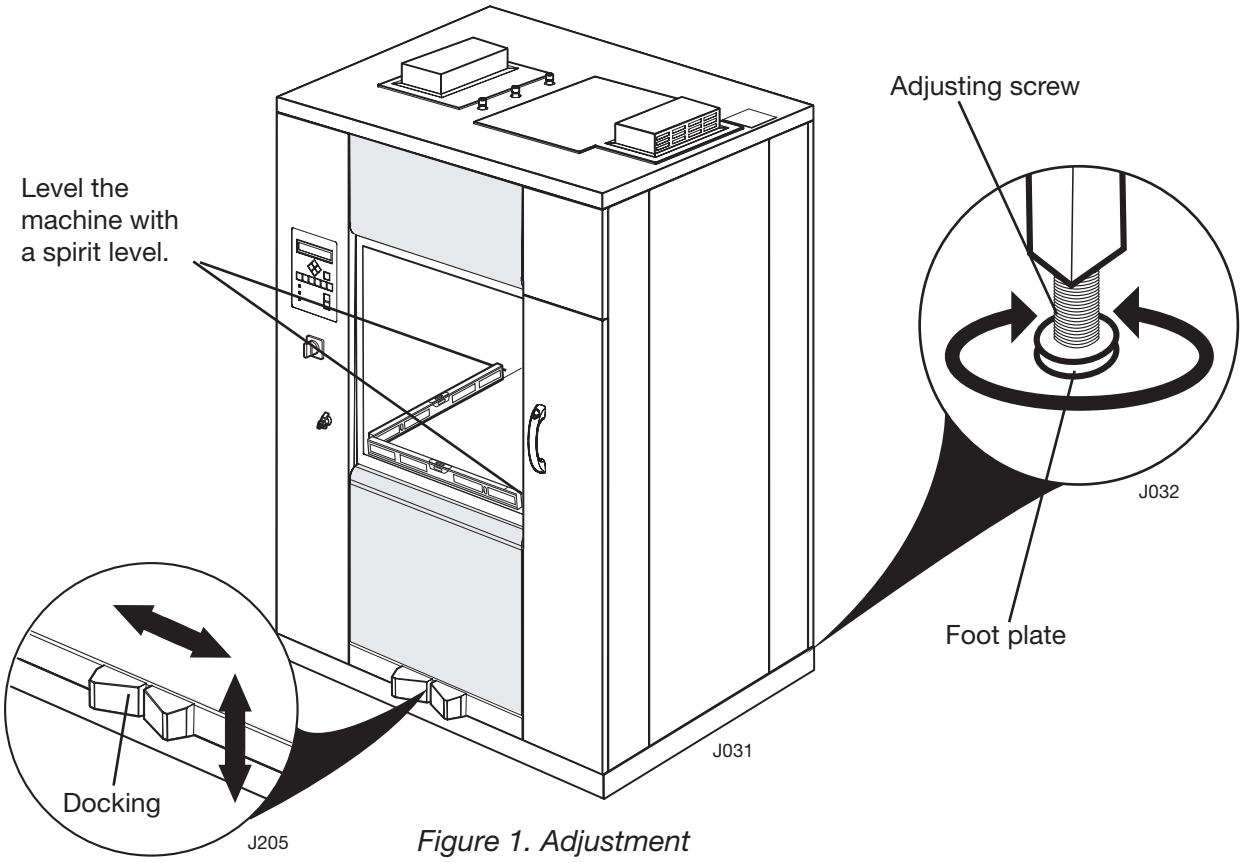

Figure 1. Adjustment

- Using a spirit level, check as shown in Figure 1 that the machine is level within ±2 mm.

If you need to move the machine by using a pallet truck:

- Position the pallet truck forks as shown in Figure 2 so as not to damage the machine.

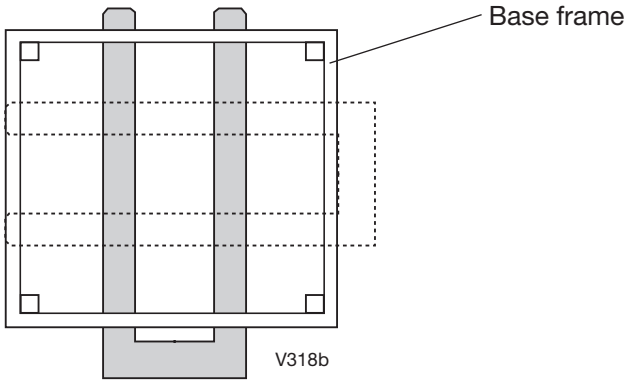

Figure 2. Positioning the pallet truck forks.

Wall-mounted model

- If the machine is to be mounted in a wall, the distance between machine and wall must be 15 mm.
- If machines are to be installed next to each other they must be adjusted to the same height on installation.
- Set the machine horizontal with a spirit level on the side of the machine and adjust with the feet.
- For the loading trolley to work in all the machines, the floor in front of them must be flat and level.

Fitting AGS

- When AGS is installed, the plinth plate must be removed, since it is replaced by a plinth plate in the AGS installation.
- Service panels on the roof must be removed and any water connections disconnected so that they can be temporarily lowered into the roof panel to reduce the height of the machine.

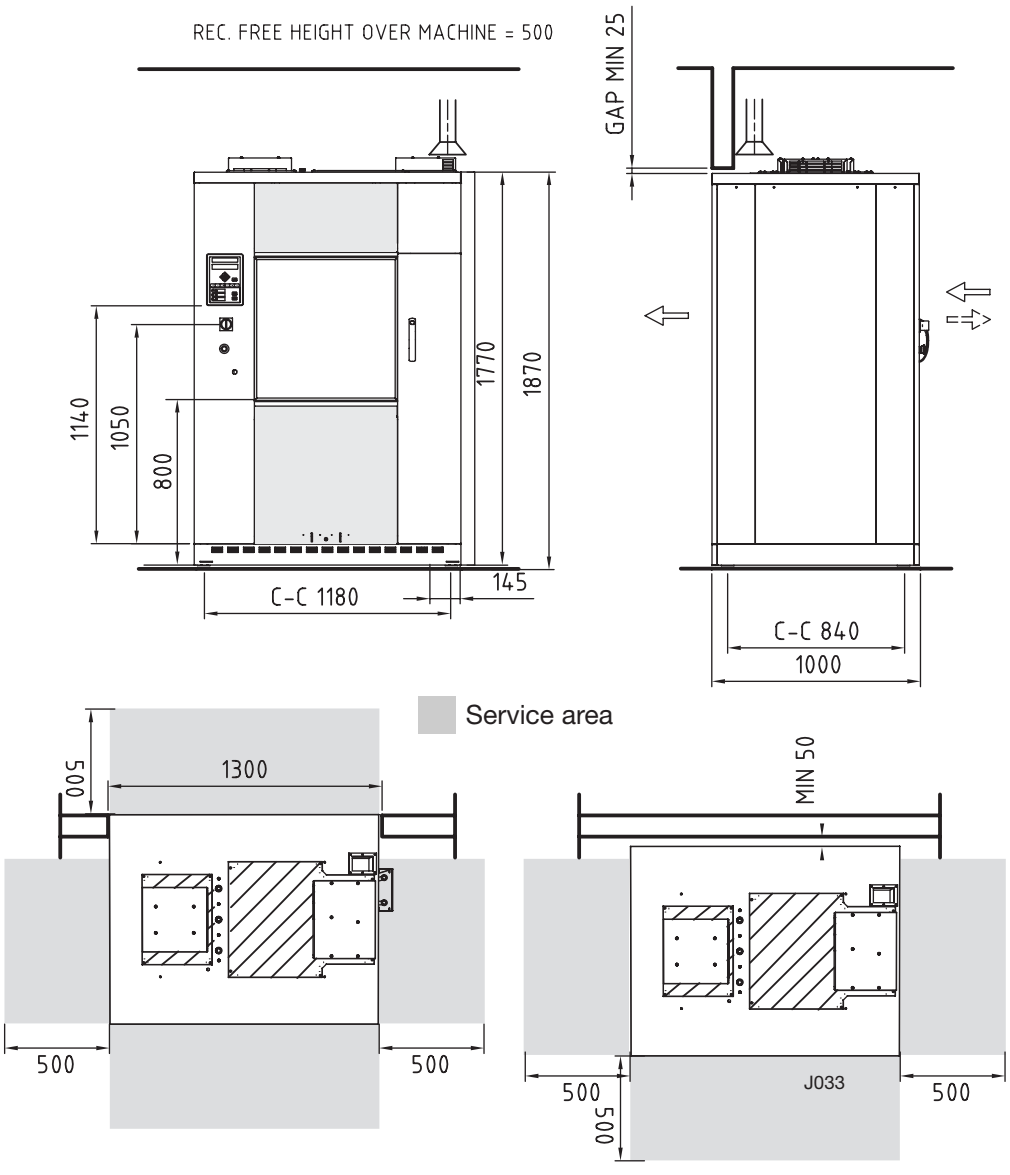

Figure: dimensions

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Connecting electric power

Installation may only be done by authorized personnel.

Connect electric power to the machine as follows:

- Connect the power supply to the electrical connections of the machine; see the diagram with alternative connection arrangements.
- For easier servicing and maintenance, the supply to the machine should be fitted with a lockable isolator with a 3 mm break gap.
  The isolator must be located in an easily accessible position on the wall.
- The supply cable must be brought in through a hole in the side, fitted with a rubber seal. The side has two holes, one on the left and one on the right.
- Remove the Plexiglas cover over the incoming side of the terminal block. Refit the Plexiglas cover when the connections have been made.
- The supply cable and any signal cables must be provided with strain relief by means of the cable glands at the bottom of the electrical cabinet.

The power supply cable to the machine must be connected to the incoming terminal strip -X01. The protective ground (earth) wire must be connected to the terminal marked with the protective ground (earth) symbol ⏚ in terminal strip –X01.

Smallest cable area for power supply.

- Steam.

Incoming terminal strip –X01 can take cables with conductor area between AWG16-8 (1.5 – 10 mm^2).
The area of the supply cable must not be less than AWG 10 (6 mm^2). Its diameter must not be less than Ø 18 mm.

- Electrical

Incoming terminal strip –X01 can take cables with conductor area between AWG16-8 (1.5 – 10 mm^2).
The area of the supply cable must not be less than AWG 8 (10 mm^2). Its diameter must not be less than Ø 21 mm.

Residual current device (RCD)
The machine is fitted with a frequency converter to control the rotation speed of the circulation pump. If there is an RCD in the power supply line to the machine, the RCD must be designed to protect equipment with a frequency converter.

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It is important that the connection has the correct overcurrent protection. The correct fuse rating is stated on the type plate.

The main switch on the front of the machine disconnects the power to all components connected to the machine that are connected after the main switch of the machine.

Cables for signal exchange may also be connected to the machine. These cables are connected to terminal strips X04 (dosing monitoring), X06 (signal exchange) and X07 (loader/unloader and AGS). When the cables have been connected, the Plexiglas shield that provides protection between terminal strip X01 and terminal strips X04-X07 must be put back in place.
See the technical manual for additional information.

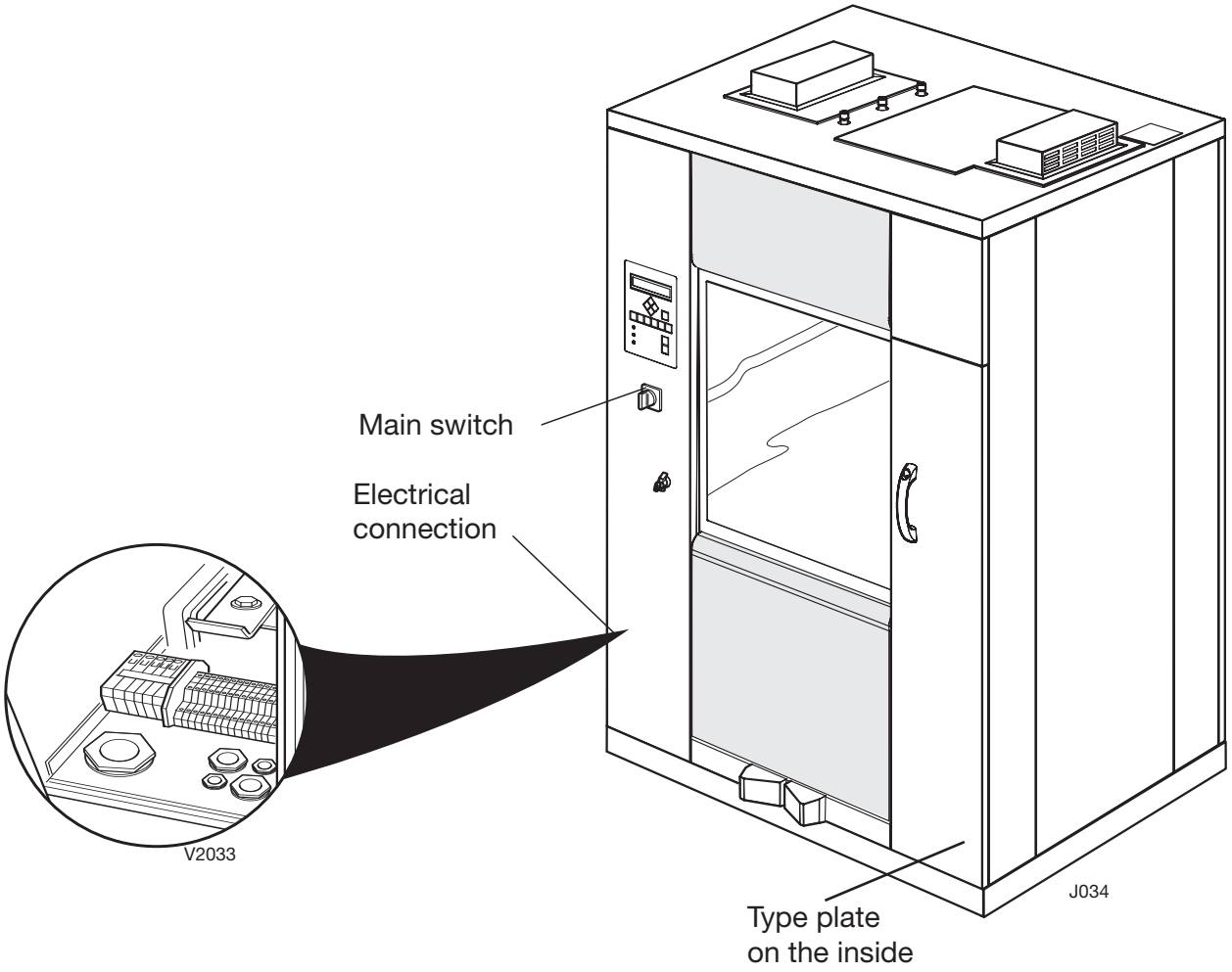

Figure 4 Electrical connection (see alternative connection arrangements)

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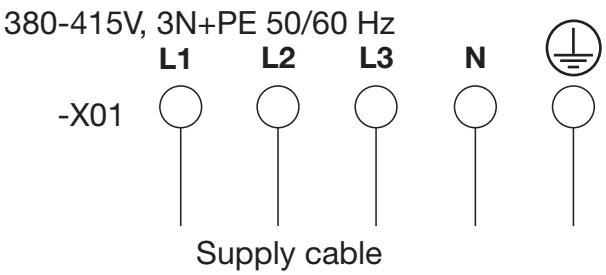
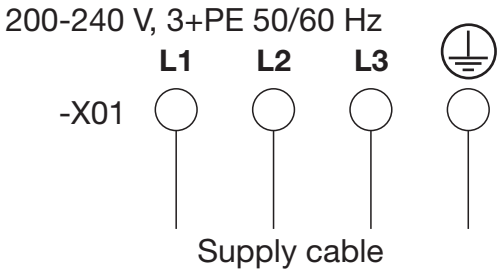
Electrically-heated chamber and electrically-heated dryer				
Voltage [V]	Connection	Frequency [Hz]	Max current [A]	Fuse [A]
380	3+PE	50/60	34	C40
400	3N+PE	50/60	35	C40
415	3N+PE	50/60	36	C40

Steam-heated chamber and electrically-heated dryer				
Voltage [V]	Connection	Frequency [Hz]	Max current [A]	Fuse [A]
200	3+PE	50/60	25	C32
208	3+PE	50/60	24	C30
230	3+PE	50/60	22	C25
240	3+PE	50/60	21	C25
380	3+PE	50/60	14	C20
400	3N+PE	50/60	14	C20
415	3N+PE	50/60	14	C20





-X01 terminal strip for incoming supply cable

Connecting water, steam, waste and dryer

Installation may only be done by authorized personnel.

- Provide water and, if required, steam connections with separate stopcocks. Flush out the water and steam pipes that are to be connected to the machine, to prevent clogging of filters and valves.
- Connect the disinfector to cold and hot water and to steam and condensate connections, if used. The connections must meet the following requirements:

	Connection	Pressure	Flow rate
Cold water	ISO G-3/4” (20 mm) female	100-800 kPa	min 40 l/min
Hot water	ISO G-3/4” (20 mm) female	100-800 kPa	min 40 l/min
Dist. water/ de-ion. water	ISO G-3/4” (20 mm) male	100-800 kPa*	min 40 l/min
Steam	ISO G-1/2” (15 mm) female	300-500 kPa	
Condensate	ISO G-1/2” (15 mm) female	max 30 kPa	
Compressed air	ISO G-1/2” (15 mm) female	400-800 kPa	

* Where the pressure is lower than 100 kPa a separate feeder pump must be used.

NOTE:
Distilled or de-ionised water must have a conductivity of less than 40 µS/cm.

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Floor connection

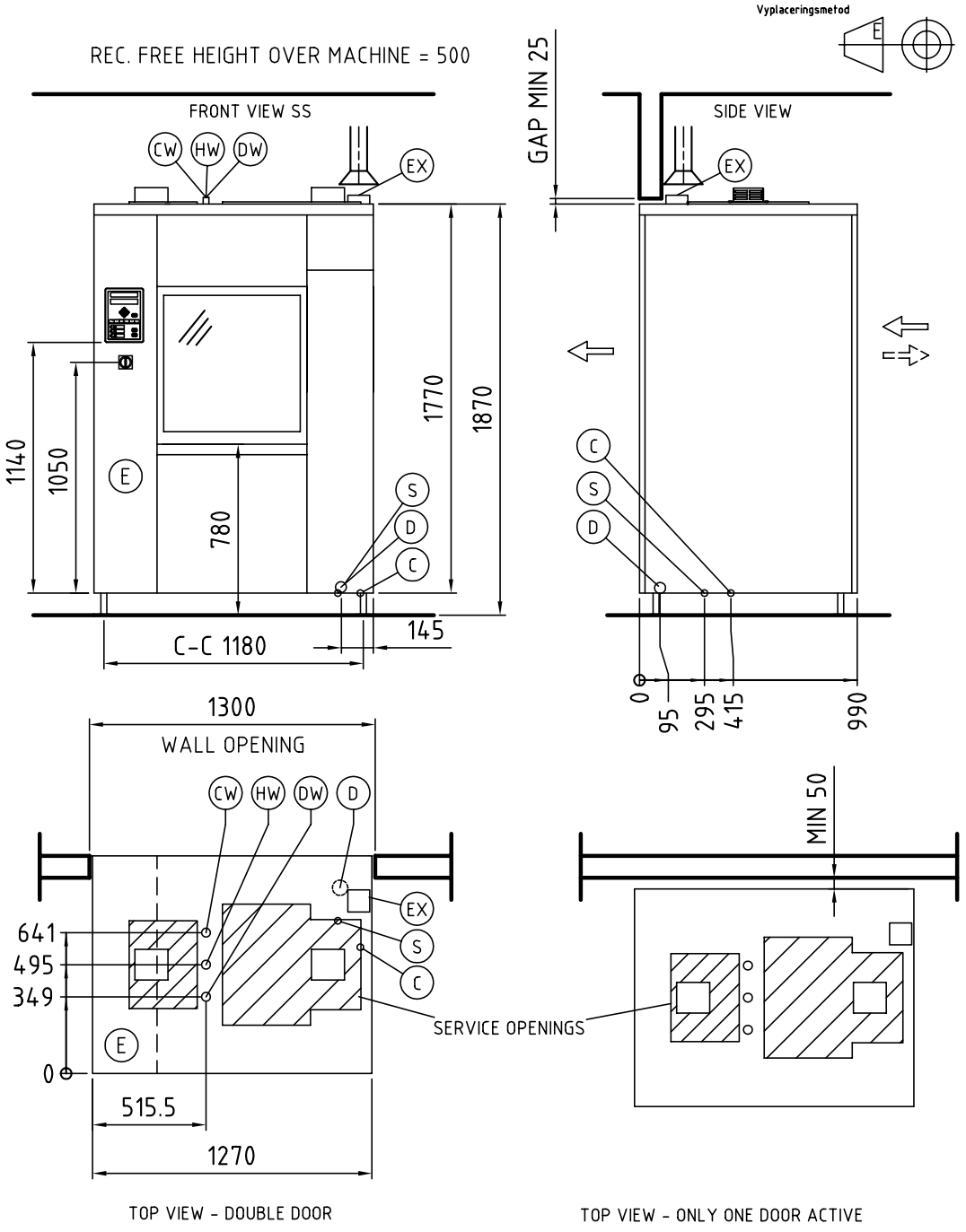

Figure 5. Connections

CW. Cold water 450 mm above the floor
HW. Hot water 450 mm above the floor
DW. Distilled/de-ionized water 450 mm from floor
Ex. Dryer exhaust air at roof
E. Electrical connection 370 mm from floor
S. Steam connection 60 mm above the floor
C. Condensate connection, 30 mm above floor
D. Waste connection 175 mm above the floor

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Ceiling connection

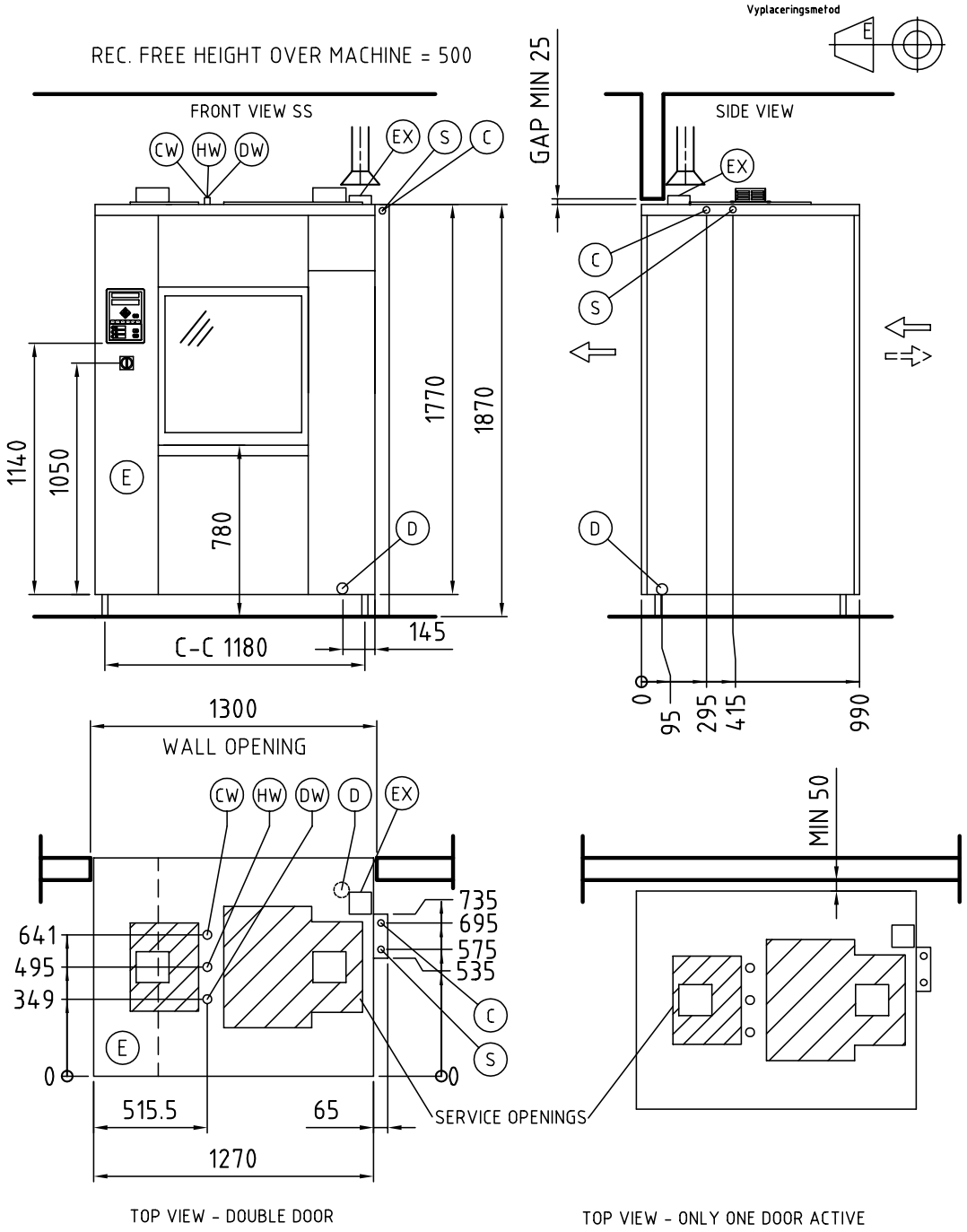

Figure 6. Connections

CW. Cold water 1905 mm above the floor
HW. Hot water 1905 mm above the floor
DW. Distilled/de-ionized water 1905 mm from floor
Ex. Dryer exhaust air at roof
E. Electrical connection 350 mm from floor
S. Steam connection 1830 mm above the floor
C. Condensate connection, 1830 mm above floor
D. Waste connection 175 mm above the floor

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- PTFE tape is recommended for sealing the connections.
- Connect the disinfector to a waste outlet with a capacity of at least 40 litres/min. Connect the waste as shown in Figure 5. Diameter of waste: 50 mm (2”).
- Where the washer disinfector is installed against a wall, or where two machines are positioned next to each other, Getinge recommends leaving a 500 mm service area.

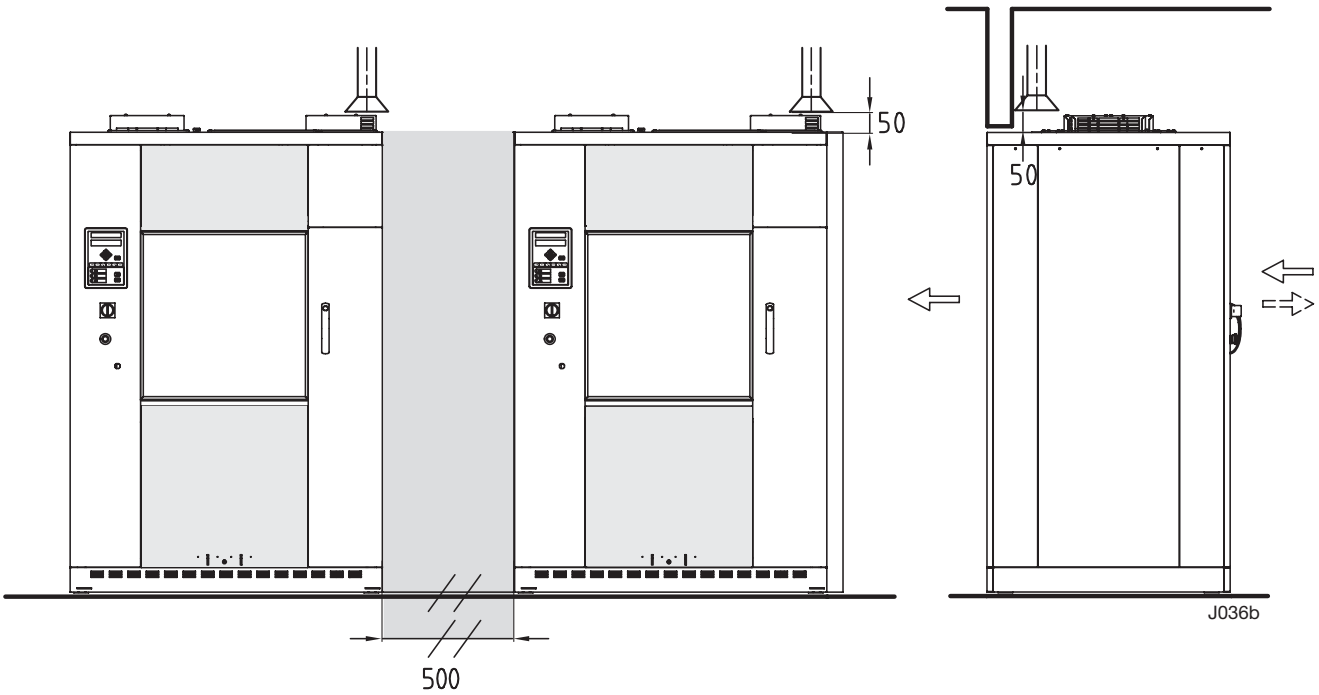

Figure 7. Connecting a dryer

- Connect air exhaust from dryer (if the machine has a dryer)
  Air volume: approx 350 m^3/h.

Model identification

The rating plate for an 88-5 washer disinfector is located in the detergent compartment. Make a written note of the type designation and serial number (No.) from the rating plate.

Type:_____

Serial number:_____
When contacting Getinge, quote the model type and serial number.

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Function check

- Check that the machine is connected to the correct voltage and the waste, water, steam and condensate connections are correctly connected. Open the valves for water and steam.
- Fill the detergent and rinse aid containers and place alarm sensors in the containers.
- When starting a new machine, the soiled-side door can be opened and closed by holding down the button for about five seconds.
- The doors of the machine have a system of interlocks to ensure that only one door can be opened at a time.
- The clean-side door can only be opened if the completed process has been approved and the soiled-side door is closed and locked.
- If the soiled-side door cannot be opened, check that the clean-side door is closed and locked. If not, close the door by pressing .
- Place a wash rack in the wash chamber and close the door.
- Choose a program where dosing is done from all the detergent and rinse-aid containers and start the machine (see the instruction manual).
- Check that the machine draws water.

Note!
On starting, there must be water in the circulation pump. If there is no water in the pump the shaft seal may be damaged.

- Check that the circulation pump is rotating in the right direction as indicated by the arrow on the pump motor. If not, isolate the power, change the phase sequence at the electrical connections and restart the machine (see the service manual for a detailed description).

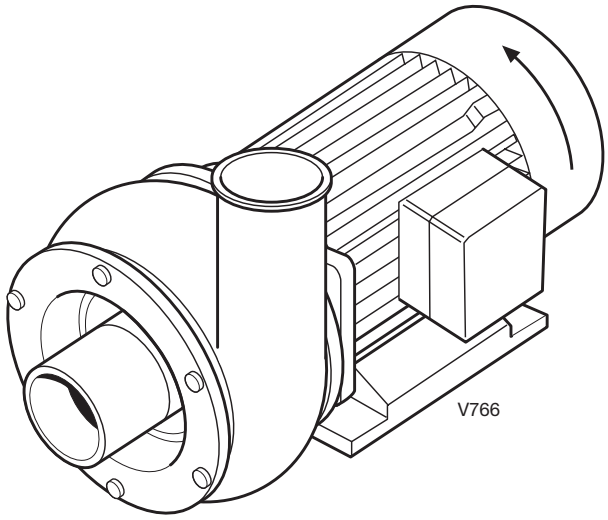

Figure 8. Circulation pump

- Check that the dosing pumps work at the right time in accordance with the program description in the instructions for use and that detergent is drawn off.
- While the program is running, check that the door(s) cannot be opened.
- Check that there are no water or steam leaks. If necessary, retighten water, steam and waste connections.

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TECHNICAL DATA

Dimensions

Outside dimensions

Width	1270 mm
Depth	990 mm
Height	1870 mm

Chamber, effective dimension

Chamber depth	800 mm
Chamber width	665 mm
Chamber height	667 mm
Chamber volume	340 litres
Material	EN1.4404, ASTM 316L

Weight including water and load.

Total	600 kg
Loading per machine foot	150 mm (four).
Specific area loading	4.7 kN/m^2

Connections

Water consumption

40 l/phase pre-rinsing and washing Note 1.

32 l/phase post-rinsing and final rinsing Note 1.

Cold water

Recommended water quality: Drinking water with max 5°dH

Connection	ISO G-3/4
Pressure	100-800 kPa
Flow rate	40 litres/min

Hot water

Recommended water quality: Preheated drinking water with max 5°dH

Recommended temperature	< 20°C (<68°F) Note 2.
Connection	ISO G-3/4
Pressure	100-800 kPa
Flow rate	40 litres/min

Distilled/de-ionized water (option)

Recommended water quality:	The maximum conductivity is determined by the desired washing result.
Max temperature	60°C (140°F) Note 2.
Connection	ISO G-3/4
Pressure	100-800 kPa (where the pressure is lower than 100 kPa, a separate pressure booster pump must be connected. This is available as an option.)
Flow rate	40 litres/min

Note 1. The water consumption varies depending on the type of wash trolley and the items.

Note 2. The water temperature affects the process time. A lower temperature gives a longer process.

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Compressed air (option with loader/unloader only)

Connection pressure	400-800 kPa

Steam (only for a machine with steam-heated chamber)

Connection	ISO G-1/2
Pressure	300-500kPa Notes 3, 4.
Max steam temperature	160 °C (320 °F)
Consumption	about 1.5 kg/min at 300 kPa

Steam (only for a machine with steam-heated chamber)

Connection	ISO G-1/2 Note 4.

Waste outlet

Dimension, out	ø75 mm (3”)
Minimum capacity of receiving drain	
1. Capacity 50 l/min,	Max 90 °C (194 °F)
2. Capacity with drain cooling (option)	90 l/min, max 60 °C (140 °F)
Recommended connection dimension	>100mm (>4 In)

Evacuation air

Air quantity	about 350 m^3/h Note 5
Max temperature:	50°C (50.00°C)
Air humidity	20-100 % Note 6

Note 2. The water temperature affects the process time. The lower the water temperature, the longer the process will take.

Note 3. The pressure and temperature of the steam affect the process time. The lower the pressure, the longer the process will take.

Note 4. The pressure differential between the supply and return lines must be greater than 100 kp.

Note 5. The connection to the machine must have an air gap of 50 mm.

Note 6. The exhaust air from the dryer must have 100% humidity not more than 5 minutes after the dryer is started.

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Environmental requirements

Air humidity max 80% at 31 °C (87 °F)

Room temperature 5-40 °C (41-104 °F)

Heat dissipation to the room

Max 6000 W hot air during drying.

Max 1500 W during disinfection at 90 °C (194 °F)

Max external temperature of the machine 50 °C (123 °F)

Sound level

Table 1 below shows the sound power level as linear octave band values and as co-weighted, A-weighted sound power level, both equivalent L_{wA} and maximum L_{wAFmax}.

Table 1

Calculated sound power level Lw for the test object, db ref 1 pW.

Octave band frequency (Hz)	125	250	500	1000	2000	4000	8000	L_{wA}	L_{wAFmax}
Correction terms (K_{ok})	65	66	67	63	63	60	58	70	76

The calculated sound power level implies different sound levels LpA in different types of space. With a larger room volume, the sound level decreases slightly and with a smaller room level it increases slightly. Table 2 below shows three example of what to expect in practice.

Table 2

Calculated sound level LpA for the test object in a 70m^3 room, db ref 20 µPa.

Type of room	Description	Operator position*	3 meters from the machine
Hard to sound	All surfaces of tile, plaster, concrete or similar, i.e. no sound absorbing surfaces and no furniture	69	69
Normally-damped	Some sound absorption in the form of furniture and textiles.	65	64
Damped	Full-cover ceiling absorbent and some furnishing with tables, chairs and textiles.	62	60

* The term “operator position” means 1 meter from the machine and 1.5 meters above the floor. All the figures are for one machine.

Degree of protection

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Other points

Circulation system

Design pressure:	300 kPa
Working pressure:	max 130 kPa
Design temperature	100°C (100.00°C)
Working temperature	93°C (92.78°C)
Material:	EN1.4404, ASTM 316L

Waste tank

Type of vessel: not closed

Material: polypropylene

Volume 50 litres (13.21 gallons)

Max temp 95 °C (203 °F)

Process tank

Type of vessel: not closed

Material: polypropylene

Volume 50 litres (13.21 gallons)

Max temp 95 °C (203 °F)

Booster tank

Type of vessel: not closed

Material: EN1.4404 ASTM 316L

Volume 35 litres (9.24 gallons)

Max temp 99°C (98.89°C)

Circulation pump

Flow rate: Q max 1000 litres/min

Power: 2.2 kW

Material:

Pump body: EN1.4404, ASTM 316L

Pump impeller PP

Drain pump

Flow rate: Q max 50 litres/min

Power: 170 W

Material:

Pump body: PP

Impeller: PP

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Water quality - washer disinfectors

The quality of the water used in all stages of cleaning is important for good results.

The water used in each stage must be compatible with:
* The material of which the washer disinfector is made
* The chemicals used in the process
* Process requirements for the various stages of the process

The main factors for good water quality are:

Hardness	High hardness will cause lime scale deposits in the washer disinfector, leading to poor cleaning results.
Ionic contaminants	A high concentration of ionic contaminants may cause corrosion and pitting on stainless steel. Heavy metals such as iron, manganese or copper cause instruments to tarnish.
Microbial contaminants	The water used should not increase the biological load on the equipment that is being treated against micro-organisms and their residual products which may cause fever-like symptoms when they get into the human body.
Sanitary chemicals	High concentrations of and high exposure to sanitary chemicals may cause corrosion and pitting on stainless steel.

Getinge Disinfection AB therefore recommends that water used in the pre-rinsing, washing and final rinsing phases should be of drinkable quality in accordance with the guidelines. Detailed information about acceptable water quality can be found in “Guidelines for Drinking Water Quality 3rd Edition” published by WHO.

Getinge Disinfection AB also recommends following local standards. RO (reverse-osmosis)water (or similarly treated water) is used for the final washing/disinfection phase. A typical specification for RO water is:

pH	5.5 to 8
Conductivity	<30 µs.cm^{-1}
TDS	<40 mg/l
Maximum hardness	<50 mg/l
Chlorine	<10 mg/l
Heavy metals	<10 mg/l
Phosphates	<0.2 mg/l as P_2O_5
Silicates	<0.2 mg/l as SiO_2
Endotoxins	<0.25 EU/ml
Total number of micro-organisms	<100 per 100 ml

Further advice should also be obtained from the manufacturers of chemical and medical equipment.

Where local standards are stricter that Getinge Disinfection AB’s recommendations, they should be followed. Note that it is the customer’s responsibility to supply the washer disinfector with suitable water.

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